

Characteristics of high- and low-risk drinkers who use online alcohol home delivery in Western Australia

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Abstract

Introduction: Variation in alcohol availability is an important driver of levels of consumption and harm, with recent increases in online alcohol home delivery use expanding availability. There is limited research on the impacts of these changes and the characteristics of consumers who use alcohol home delivery.

Methods: This study presents findings from an online survey ($n = 465$) of Western Australian adults who had purchased alcohol for home delivery within the past 6 months. Analyses compared high-risk and low-risk drinkers on use of, and exposure to, alcohol home delivery.

Results: Compared to low-risk drinkers, high-risk drinkers were significantly more likely to make more frequent online purchases (odds ratio 5.42), utilise same day delivery (odds ratio 2.91) and purchase through specialised online-only retailers (odds ratio 2.69). High-risk drinkers also reported receiving deliveries while intoxicated more often (odds ratio 11.62), and ordering alcohol for delivery to continue a current drinking session (odds ratio 7.47). High-risk drinkers also received advertising for alcohol home delivery more frequently (odds ratio 1.60) than low-risk drinkers. High-risk drinkers also ordered larger quantities of alcohol than low-risk drinkers ($M = 49$ vs. 32 standard drinks).

Discussion and Conclusions: Findings from this study indicate that these services are popular with high-risk drinkers and potentially undermine other policy efforts to reduce drinking. Within Australia, stronger legislation (such as mandatory delay between order and delivery) and monitoring (e.g., test purchasing for compliance) are recommended.

KEYWORDS

alcohol, home delivery, online, risky drinking, Western Australia

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1 | INTRODUCTION

The rapid rise of alcohol home delivery through online sales represents one of the biggest moves towards increasing alcohol supply and availability in recent years. Industry reports indicate that from 2019 to 2020, online alcohol sales within Australia increased between 50% and 500% [1-3]. Australian online alcohol sales were estimated at \$1.8 billion in 2021 [4] and global sales are predicted to grow by 66% over the next 5 years [5]. The recent growth in alcohol delivery sales has also been observed internationally [6]. Although some of the recent growth in sales may be attributed to lockdowns and contactless delivery requirements during the COVID-19 pandemic, it is feasible that some of the increase in online alcohol purchases and home delivery will be permanent. Expansion of online sales has led to increased diversity of retailers and alcohol purchasing options, ranging from wholesale wine purchases to rapid home deliveries (i.e., deliveries in less than 2 h) from bottle shops or supermarkets. Increased availability of alcohol is closely associated with increased level of consumption and alcohol-related harms [7], particularly injuries such as assaults and road crashes [8-11]. However, the lack of alcohol policy change associated with increased alcohol home delivery has potentially transformed the nature of this relationship. This transformation in alcohol availability has also shifted consumers from being able to only access alcohol in physically distinct controlled environments, such as licensed hotels or staffed take-away outlets, to a landscape where alcohol can be delivered to the customer's door in less than 2 h.

Availability of alcohol is a key driver of harmful impacts of alcohol use and includes physical, economic, social and psychological availability [12]. Availability theory posits increased alcohol availability leads to increased consumption and subsequently harm. Thus, alcohol home delivery, through expedient delivery, convenience and targeted marketing, may increase the likelihood of alcohol consumption and related harms. Alcohol home delivery could have both potential additive (i.e., new specialised online only alcohol retailers) and synergistic (i.e., existing 'bricks and mortar' stores updating their business to also include delivery options) effects on alcohol availability.

Home delivery of alcohol may be particularly harmful for people who are vulnerable to alcohol use problems. Recent analysis of online alcohol retailer websites suggests that online retailers may promote risky drinking habits through general advertising cheap high alcohol content products, such as bottled wine, offering 'buy now pay later' options, and emphasising contactless and on-demand delivery [13]. Consumers who purchase alcohol online are also consistently exposed to targeted marketing messages, discount opportunities via both email and push notifications, and reinforcement of the speed of delivery (typically

1 to 2 h), directly encouraging impulse purchases [14]. These strategies allow cheap alcohol to be conveniently accessed, including by intoxicated individuals. Given the established relationship between increased alcohol availability and increased alcohol-related harms [15, 16], it is important to understand the characteristics of consumers who use alcohol home delivery.

There is limited research investigating the use of alcohol home delivery retailers, and the associated risks, however, what is available suggests increased consumption and harms among individuals who utilise such retailers [17-19]. Increased alcohol availability through online companies has also provided opportunities for drinkers to continue a current drinking session without having to leave their home. For instance, recent Australian research shows 27% of participants who used online alcohol retailers stated they would have ceased drinking if rapid delivery options were not available [17] and using rapid alcohol delivery and/or using alcohol home delivery to extend a drinking session were significantly associated with higher odds of harmful drinking behaviours [20]. One case study shows that use of rapid alcohol home delivery was directly linked to the death of a man from New South Wales in June 2018 [21]. This individual had two deliveries of three bottles of wine from a single delivery company, each only 10 min apart [21]. In the weeks before he died, he had three bottles of wine delivered to his home almost every day. Literature from the United States also indicates for young adults, purchasing alcohol through online home delivery is associated with high-risk drinking [22]. Further, alcohol is also heavily advertised online, via algorithmic targeting and personalisation of messages [14]. These advertisements typically contain links to initiate seamless and convenient purchases, thus enabling impulsive buys. Home delivery is integrated within this frictionless purchasing experience.

The current paper presents findings from a larger study examining alcohol home delivery within Western Australia [23] and aims to compare characteristics of use of alcohol home delivery between high- and low-risk drinkers. Specifically, this study will use an online survey to explore the behaviours and experiences of Western Australian (WA) adults who have purchased alcohol for home delivery within 6 months prior to the survey. Typical and most recent purchase behaviours, and exposure to advertising for alcohol home delivery will be explored.

2 | METHOD

2.1 | Participants and procedure

Ethics approval was obtained from Deakin University (93_2022) prior to commencing. Adults (≥ 18 years)

residing in WA who had purchased alcohol for home delivery within the last 6 months were invited to take part. Participants were recruited using an online research panel (PureProfile). PureProfile recruits panel members through extensive online and offline methods to ensure representativeness of the Australian population, including harder to reach populations (such as young adult men). Soft quotas for age and gender were used, reflective of the WA population [24]. A link to the survey, hosted on Qualtrics, was provided to participants via email or advertising. At no stage did the panel provider have access to participant data. After reading the plain language statement participants indicated consent to take part by clicking 'I agree' prior to commencing the survey. Participant responses were only recorded if they submitted the survey after the final question. The survey took an average of 9 min to complete. Panel members were provided payment for participation. This payment depended on the length and type of activity they choose to take part in.

2.2 | Measures

Survey questions were adapted from prior online alcohol delivery work within the team [17] and assessed usual alcohol home delivery purchase behaviour, changes in behaviour due to COVID-19, exposure to advertising, most recent purchase and retailer adherence to liquor regulations (e.g., ID checks at time of delivery). Items used for the current study are described below.

2.2.1 | Demographic information

Participants' age, gender, location (Perth or other) and postcode were recorded. Postcode data were used to code for socio-economic status using the 2016 Socio-Economic Index for Areas (SEIFA) Index of Relative Socio-Economic Disadvantage (IRSD) [25]. Lower SEIFA-IRSD scores indicated relative greater disadvantage and higher scores indicated relative lower disadvantage. SEIFA-IRSD rankings within WA were used to generate tertiles (<33%, 34%–67%, >67%) of low-, mid- and high-socio-economic status.

2.2.2 | Alcohol use disorders identification test

The Alcohol Use Disorder Identification Test (AUDIT) was utilised to assess participant alcohol consumption behaviours over the last past year. The AUDIT is a validated screening tool for both hazardous drinking

behaviours and problematic alcohol use across a wide range of demographics [26]. The AUDIT assesses quantity and frequency of alcohol consumption during a typical drinking session (i.e., 'How many standard drinks containing alcohol do you have on a typical day when drinking?'), potential of alcohol dependency (i.e., 'During the past year, how often have you needed a drink in the morning to get yourself going after a heavy drinking session?') and harms stemming from alcohol use (i.e., 'Have you or someone else been injured as a result of your drinking?'). Responses are recorded on five-point Likert scales (i.e., 0 = never/0–1 times a month, 5 = daily or almost daily) then summed to a maximum possible score of 40. For all analyses, participant responses were dichotomised into high-risk drinkers (score of ≥ 8) and low-risk drinkers (score of ≤ 7).

2.2.3 | Usual purchase behaviours

How often participants purchased alcohol online in the past 12 months was assessed, with response options ranging from daily to less than monthly; response options were dichotomised into 'monthly or less than monthly' versus 'weekly to daily'. We also asked participants how long (in their experience) delivery of alcohol usually takes from time of order (less than 2 h to two or more days later); response options were dichotomised into 'same day' or 'next day or longer'. The proportion of participants who used specialised online-only alcohol shops was also assessed ('yes' versus 'no'). Additionally, participants were asked how often they are in a state of intoxication when receiving alcohol delivered to their residence (dichotomised into 'never' versus 'at least sometimes') and if they had ever ordered alcohol online to continue a current drinking session ('yes' versus 'no').

2.2.4 | Exposure to advertising

Exposure to advertising was assessed by asking participants whether they had received advertising material from online alcohol shops in their social media feed or via email, push notifications, text message or phone call ('yes' versus 'no'). Those who responded 'yes', were then asked how often they received such advertising (dichotomised into 'weekly or less' vs. 'every couple of days or more').

2.2.5 | Most recent purchase

Most recent online alcohol order for home delivery was also assessed. Participants were asked about the

timeframe for their most recent delivery, with response options dichotomised into ‘same day’ and ‘next day or longer’. Using two items which were combined for analysis (‘yes’ vs. ‘no’), participants were also asked whether their most recent purchase was due to a promotion. The first item asked participants what was their main reason for making their specific alcohol purchase, with ‘on special’ and ‘promotion’ provided as options. Those who did not select either of these were asked a follow-up question assessing if the alcohol they purchased was ‘on sale’ or ‘on special’, part of a promotional deal, or if any kind of discount or gift came with the purchase.

For participants who indicated their most recent purchase was for same day delivery, number of standard drinks purchased was estimated from beverage type and quantity. Items used in the current study followed that used in Mojica-Perez et al. [17]. The number of standard drinks was calculated using the method that multiplied the purchased alcohol volume (in millilitres) by the percentage of alcohol content by quantity, then divided the results by 12.5 (the specific weight of alcohol). For example, for a small bottle (375 mL) of beer (4.48% alcohol) the standard drink was calculated by $(0.048 \times 375) / 12.5 = 1.44$ standard drinks.

2.3 | Data analysis

Data were analysed using Stata v.17 [27]. A series of multivariable regression models (logistic or linear as appropriate), controlling for age and gender, were used to compare high-risk and low-risk drinkers regarding usual purchasing behaviours, exposure to advertising, and most recent purchase. An exploratory mediation analysis assessing a possible indirect effect from high-risk drinking to frequency of purchases through exposure to advertising was also conducted using the *gsem* command. The *margins* command was used to obtain adjusted (for age) percentages.

3 | RESULTS

3.1 | Demographics

A total of 171 (36%) participants were classified as high-risk drinkers and 294 participants were low-risk drinkers (62%). Ten participants did not respond to one or more AUDIT items. These missing responses were random and participants without complete AUDIT responses were excluded from analyses; analytic $n = 465$. Table 1 provides participant demographics by drinking category. AUDIT responses indicated there were no non-drinkers in our sample. High-risk drinkers were significantly younger, therefore, all models controlled for age.

TABLE 1 Participant demographics, by high- and low-risk drinkers.

	High-risk	Low-risk
	M (SE)	M (SE)
Age* ($n = 464$)	40.9 (1.13)	46.8 (1.00)
	%	%
Gender ^a ($n = 464$)		
Male	53	45
Female	47	55
Location ($n = 463$)		
Perth	87	84
Other	13	16
Socio-economic status ^b ($n = 426$)		
Low	20	21
Mid	36	34
High	44	45

Note: Percentages may not add to 100% due to rounding.

^aOne participant identified as non-binary.

^bAs measured by the Socio-Economic Index for Areas Index of Relative Socio-Economic Disadvantage.

* $p < 0.05$.

3.2 | Usual alcohol home delivery purchase behaviour

Table 2 provides details for multivariable logistic regression models examining differences between low-risk and high-risk drinkers for usual alcohol home delivery purchase behaviour. As shown, high-risk drinkers were significantly more likely than low-risk drinkers to make more frequent online purchases for home delivery. High-risk drinkers were significantly more likely to purchase through specialised online-only retailers (as opposed to retailers such as supermarkets and independent or large-chain liquor stores with physical stores) compared to low-risk drinkers. Further, compared to low-risk drinkers, high-risk drinkers were also significantly more likely to report receiving an order while intoxicated at least sometimes. High-risk drinkers were also more likely to order alcohol for delivery in order to continue a current drinking session.

3.3 | Exposure to advertising for alcohol home delivery

Multivariable logistic regression models indicated high-risk drinkers were significantly more likely to report receiving advertising for alcohol home delivery and receive such advertising on a more frequent basis than low-risk drinkers (see Table 3). Exploratory analysis

TABLE 2 Logistic regression models for characteristics of alcohol home delivery purchases, by high- and low-risk drinkers.

Measure	Low-risk, %	High-risk, %	AOR (95% CI)	p-value
Frequency of online purchases (<i>n</i> = 463)				
Monthly or less than monthly	95	79	(Ref)	
Weekly to daily	5	21	5.42 (2.80, 10.50)	<0.001
Delivery time frame (<i>n</i> = 463)				
Next day or longer	69	44	(Ref)	
Same day	31	56	2.98 (2.00, 4.45)	<0.001
Purchase from specialised online-only retailers (<i>n</i> = 487)				
No	94	86	(Ref)	
Yes	6	14	2.69 (1.39, 5.18)	0.003
Receive orders while intoxicated (<i>n</i> = 486)				
Never	91	51	(Ref)	
At least sometimes	9	49	11.62 (6.85, 19.73)	<0.001
Order alcohol online to continue drinking session (<i>n</i> = 487)				
No	91	60	(Ref)	
Yes	9	40	7.47 (4.43, 12.58)	<0.001

Note: Models and percentages adjust for age.

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval.

TABLE 3 Logistic regression models for exposure to advertising for alcohol home delivery, by high- and low-risk drinkers.

Measure	Low-risk, %	High-risk, %	AOR (95% CI)	p-value
Do you receive advertising (<i>n</i> = 461)				
No	40	30	(Ref)	
Yes	60	70	1.60 (1.07, 2.42)	0.024
Frequency of advertising exposure ^a (<i>n</i> = 296)				
Weekly or less	58	37	(Ref)	
Every couple of days to several times a day	42	63	2.32 (1.43, 3.79)	0.001

Note: Models and percentages adjust for age.

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval.

^aFor those who indicated 'yes' received advertising.

using the *gsem* command was conducted to investigate a possible indirect effect from risky drinking to purchasing frequency through frequency of exposure to advertising. The indirect effect was not significant, suggesting the increased frequency of advertising exposure within high-risk drinkers was not related to greater purchasing frequency.

3.4 | Most recent online home delivery

The majority of high-risk drinkers (59.4%) made their most recent purchase within the last month, while the

majority of low-risk drinkers' (51.7%) most recent purchase was between 1 week to 2 months prior to the survey. Table 4 shows multivariable logistic regression models indicated High-risk drinkers' most recent order was significantly more likely to be a same day delivery, compared to low-risk drinkers. However, there were no significant differences between high-risk and low-risk drinkers regarding whether or not the purchases were prompted by a promotion. A multivariable linear regression model showed that among those for whom the most recent order was for same day delivery, high-risk drinkers ordered significantly more standard drinks than low-risk drinkers. Among high-risk drinkers, an average sized

TABLE 4 Logistic and liner regression models for characteristics of most recent online home delivery, by high- and low-risk drinkers.

Measure	Low-risk, %	High-risk, %	AOR (95% CI)	p-value
Delivery time frame (<i>n</i> = 482)				
Next day or longer	68	43	(Ref)	
Same day	32	57	2.91 (1.94, 4.35)	<0.001
Recent purchase due to promotion (<i>n</i> = 487)				
No	41	37	(Ref)	
Yes	59	63	1.20 (0.81, 1.79)	0.356
	Low-risk, M (SE)	High-risk, M (SE)	b-weight (95% CI)	p-value
Number of standard drinks for same day order (<i>n</i> = 158)	32 (4.75)	49 (4.48)	16.59 (3.66, 29.52)	0.012

Note: Models and percentages adjust for age.

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval.

order was equivalent to six bottles of wine, or 35 full-strength beers (approximately a larger size carton), whereas for low-risk drinkers, average order size was four bottles of wine, or 22 full-strength beers (approximately a standard size carton).

3.5 | Sensitivity analyses

Analyses were rerun to determine if there were any differences between high-risk (AUDIT score = 8–14) and hazardous (AUDIT score = 15+) drinkers (see Tables S1–S4, Supporting Information). Of the 171 high-risk drinkers, 54 (32%) had an AUDIT score of 15 or more. Compared to participants with an AUDIT score of 8–14, those who scored 15 or more were significantly more likely to: (i) order alcohol for home delivery weekly to daily; (ii) receive an order while intoxicated; and (iii) order alcohol online to continue a drinking session.

4 | DISCUSSION

The current study presents the characteristics of alcohol home delivery use in a sample of adult high- and low-risk drinkers in Western Australia. High-risk drinkers in our sample made larger, more frequent and more rapid purchases compared to low-risk drinkers. High-risk drinkers were also more likely to purchase from specialised online only alcohol retailers (e.g., Jimmy Brings). While the amount and frequency consumed through home delivery retailers aligns with expected high-risk drinking patterns, our findings also suggest greater uptake of alcohol home delivery usage by high-risk drinkers.

High-risk drinkers were also more likely to have been exposed to advertising for home delivery retailers,

however, increased exposure to advertising did not appear to lead to increased purchase amounts. Therefore, while exposure to an advertisement alone may not prompt a purchase, there is likely to be a cumulative effect of seeing regular advertising resulting in more frequent and larger purchases by high-risk drinkers. For these people who are at the highest risk of harms from alcohol, exposure to marketing has been shown to increase alcohol cravings, trigger a desire to drink and make it more difficult to reduce alcohol use [28, 29]. Increasingly, advertising on social media platforms provides a direct link to purchase alcohol online, which can be delivered to homes in under 2 h [30, 31]. Further, algorithms on social media platforms allow the alcohol companies to deliberately target heavy alcohol consumers [32, 33]. The increased exposure to advertising among high-risk drinkers in our sample does suggest a level of targeting by specialised online alcohol delivery retailers, which high-risk drinkers use more frequently. However, further research is needed to explore specific types of advertising and/or direct promotions drinkers are exposed to, the frequency of advertisements, timing of advertising (e.g., are they more often on a Friday or Saturday night or associated with major sporting events) and advertising as a motivation for purchase.

Compared to low-risk drinkers, high-risk drinkers were more likely to receive orders while intoxicated (nearly half of the high-risk sample indicated at least sometimes being intoxicated when receiving order) and to have used home delivery to continue a drinking session (approximately 40% of high-risk drinkers). Subjective ratings of intoxication consist of a combination of interoceptive cues, behavioural changes and comparison to norms [34], and self-assessed subjective ratings may not correspond to objective intoxication measures, such as blood alcohol concentration [35]. However, our

findings are consistent with Colbert et al. [20] and provide initial indications that alcohol home delivery may enable continuation of heavy drinking patterns for high-risk drinkers. A recent audit of Australian alcohol home delivery websites indicated that only 3% of sites specifically mention they will not deliver to intoxicated customers [13]. While refusal of service to intoxicated patrons is a core part of responsible service of alcohol training, barriers such as being unable to identify intoxication, fear of confrontation and low threat of enforcement are cited by venue-based alcohol servers in WA as reasons for low adherence to responsible service of alcohol practices [36]. These barriers may be exacerbated when a sole delivery driver is providing alcohol to a customer, at the customer's home, without the support of other staff or managers that would typically be available in-store. Such barriers may have contributed to the preventable death associated with alcohol home delivery in New South Wales [21]. Therefore, rather than relying on individual delivery drivers to apply responsible service of alcohol appropriately, jurisdiction level policy, such as minimum delivery times (e.g., 2–3 h between order and delivery, or next day delivery only), should be implemented to reduce the opportunity for consumers to use home delivery to continue a drinking session and reduce the risk of intoxicated individuals being delivered alcohol.

When asking about their most recent purchase, compared to low-risk drinkers, high-risk drinkers were more likely to use rapid delivery and order significantly larger quantities when ordering for same day delivery. There was no difference in low- and high-risk drinkers making their most recent purchase due to a promotion, with 60% of the sample indicating a promotion was a reason for purchasing the alcohol they did. It may be that heavier drinkers do not wait until they see a promotion prior to purchasing alcohol and that they simply make regular purchases. Future research could further examine whether particular groups of drinkers are more influenced by promotions, both in terms of simply making a purchase and the amount purchased.

Findings from this study add to the growing literature base on the impacts of online alcohol delivery. Some Australian jurisdictions have recently introduced policy to help address the growing use of alcohol home delivery. For example, in February 2022, the WA Government imposed new regulations for same day alcohol deliveries, whereby photo identification must be checked at time of delivery and orders cannot be left unattended at the door [37]. Further, New South Wales have provisions for the state liquor regulator to conduct 'mystery shopper exercises' to monitor compliance with laws around sales to minors and intoxicated customers [37]. However, there is limited evaluative evidence on the effectiveness of these regulations [23, 38].

4.1 | Limitations

The current study recruited participants using an online research panel, which may not be reflective of the wider Australian population who use online alcohol home delivery. Therefore, results need to be interpreted with some caution. However, in an attempt to reduce the impact of this limitation, we apply quotas for age and gender to ensure our sample was similar to the WA population for these demographics. In addition, while there was also a slight over-representation of Perth-based residents (sample = 86% vs. WA population = 80%) [39], this is likely due to the availability of alcohol online delivery predominantly being within the greater Perth area. Additionally, this study provides a cross-sectional snapshot of the characteristics of consumers who use alcohol home delivery within a sample of WA drinkers; further surveys are needed to track changes in use and behaviours over time. To achieve a more comprehensive examination of prevalence of use and harms associated with alcohol home delivery, future research could also include a control group of high-risk drinkers who do not purchase alcohol online for home delivery. Finally, using a 12-month timeframe for usual purchases may have resulted in some degree of inaccuracy of recall of purchase events. However, all participants were required to have made an online alcohol home delivery purchase within the last 6 months, with most participants' (low-risk = 62.6%; high-risk = 68.3%) most recent purchase within the last 2 months. Further, this timeframe is consistent with prior research [17].

5 | CONCLUSION

The current study found high-risk drinkers purchase larger amounts of alcohol, purchase alcohol more often, and are more likely to use rapid delivery online options compared to low-risk drinkers. Almost half of high-risk drinkers indicated that they, at least sometimes, received deliveries while intoxicated and just under half have used alcohol home delivery to continue a drinking session. Our findings provide an initial indication that the removal of physical restraints to obtaining alcohol, enabled by easily-accessible online purchasing options may facilitate harmful drinking practices among drinkers already considered at high-risk of an alcohol use disorder. This highlights the need for Australian jurisdictions to introduce stronger legislation and test purchasing by regulators to assess retailer compliance. Treatment providers also need to be aware of the possible impacts of home delivery on their clients' ability to reduce, or abstain from, alcohol use. Future studies should confirm the

concerning finding that high-risk drinkers may face increased difficulties reducing alcohol use where alcohol is more readily available online.

AUTHOR CONTRIBUTIONS

Each author certifies that their contribution to this work meets the standards of the International Committee of Medical Journal Editors.








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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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